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Sommario/riassunto

This book allows the reader to understand the fundamentals of polarization phenomena in a general spin system, showing the polarizations to be indispensable information source of spin-dependent interactions. Particularly, the book describes polarization phenomena in nuclear scattering and reactions in detail, and explains how they provide information concerning spin-dependent interactions between the related particles. The concepts of polarization observables are explained, explicitly in the scattering of protons, deuterons and 7Li nuclei. In looking at deuteron and 7Li scattering, interactions induced by the virtual excitation of projectiles are examined in detail. Resonance reactions are investigated, focusing attention on the polarization of observables, which suggests that polarization phenomena can be used to determine the spin parity of the resonance. It is noted that in few-nucleon systems, the discrepancy between the values of polarization observables based on theoretical models and the corresponding values obtained through experimental data, is an important problem to be solved in the future. Solving this problem should provide new knowledge concerning the nuclear forces between nucleons. The author has chosen open-access publishing for this book to allow any interested person to study this branch of nuclear physics.

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